

DIRECTIONS

FOR INSTALLING

**THE LENNOX
TORRID ZONE
ALL STEEL
FURNACE**



MANUFACTURED BY

THE LENNOX FURNACE COMPANY

200 LINCOLN HIGHWAY, MARSHALLTOWN, IOWA

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Alan O'Bright

The Lennox Torrid Zone All Steel Furnace



BUILT FOR SERVICE

THE LENNOX FURNACE CO.
200 LINCOLN HIGHWAY MARSHALLTOWN, IOWA

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The Torrid Zone Furnace

CONSISTS OF

1. Furnace Body.
2. Radiator.
3. Front.
4. Bundle of side grates (two).
5. Bundle containing shaker grate, connecting bar and shaker handle.
6. Feed chute and front liner.
7. Sectional base ring.
8. Fire pot lining (Firebrick; cast liners; or combination of the two).
9. Water pan and frame.
10. One set casing rings (One split and one solid). These will be found crated with the hood, when hood is ordered.
11. Damper rod and poker.
12. Bag of fittings, containing:
 - Two draft lifts.
 - Three Torrid Zone door handles.
 - Two pound can Asbestos Furnace Cement.
 - Two counterbalance weights for regulator.
 - Oxidized copper regulator.
 - Check draft. (Connect to smoke pipe, see Fig.)
 - Two brick guards. (Not furnished with all cast fire pot).
 - Two radiator brackets.
 - Two raidator legs furnished with 435, 436, and 437. With 438 Radiator brackets and legs will be found bundled and not in bag of fittings.
 - Water pan lid.
 - Asbestos paper for packing front.

Bag of miscellaneous nuts and bolts, containing:

- 20 $\frac{3}{8}$ x1 square head machine bolts, for fastening front and radiator brackets to body.
- 4 $\frac{3}{8}$ x1 $\frac{1}{4}$ square head machine bolts for fastening front to door cap and brick guards to feed chute.
- 2 $\frac{3}{8}$ x1 $\frac{1}{2}$ round head stove bolts for fastening feed chute to front.
- 10 $\frac{3}{8}$ x1 flat head stove bolts for fastening base ring sections together. (Twelve furnished with 029, 131, 132. Ten $\frac{1}{4}$ x2 $\frac{1}{4}$ round head stove bolts furnished with 435, 436, 437 and 438 in place of above.)
- 2 $\frac{1}{4}$ x1 $\frac{1}{4}$ round head stove bolts for fastening casing rings to front.
- 1 $\frac{1}{4}$ x1 $\frac{3}{4}$ round head stove bolts for fastening radiator cleanout lid to collar.
- 4 $\frac{1}{4}$ x2 $\frac{1}{4}$ round head stove bolts for casing draw bolts.
- 50 $\frac{1}{4}$ x $\frac{3}{4}$ round head stove bolts for fastening casing to front, water pan frame to casing, check draft to smoke pipe draft lifts to front and damper rod washer to casing.

Nuts for above.

- 2 No. 8 round head blued screws for fastening regulator to wall.
- 5 Spring cotters. (Six with 132, 437 and 438).
- 1 Throat lug pin. ($\frac{3}{8}$ x2 $\frac{3}{4}$).
- 3 Connecting bar pins. ($\frac{3}{8}$ x2). (Four with 132, 437 and 438).
- 4 Pulleys.
- 16 Feet chain.
- 1 Cast iron damper rod washer.

All parts are marked for the furnace to which they have been fitted. For your convenience do not interchange parts.

Directions for Setting Torrid Zone Furnace

1. Having determined the location for the heater as centrally as possible, considering the heating requirements, unpack the bag of fittings wired to the grate rest inside the furnace body. Sort the bolts and nuts in the small bag according to size and length so they will be easy to get when needed.

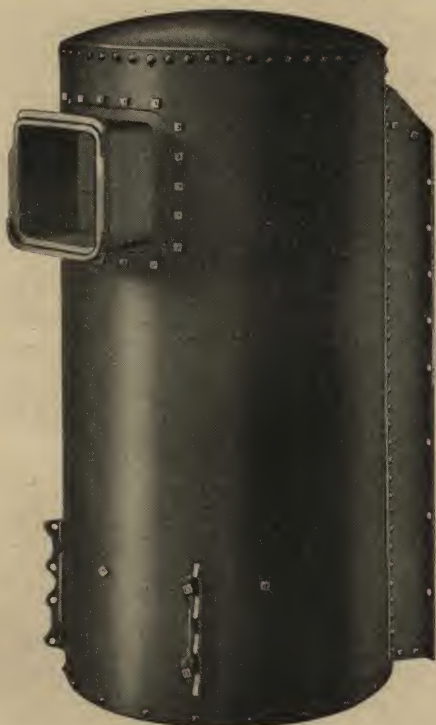


Figure No. 1

2. Place the base ring sections on the floor in their proper order and bolt together with the $\frac{3}{8}$ x1 flat head bolts, heads on the under side. Tighten bolts until the ring is rigid. Put the ring in position and level carefully.

3. If a pit is used, one or more piers 8x8, depending on size of furnace, should be built under the back of the inner ring and located where the sections are bolted together.

4. Place the combustion chamber (Fig. 1) in position on the ring as far back as the flanges on the front will allow. Care must be used not to move the base ring out of level.

5. Put the two side grates in place on the grate rest, so the lugs extend into the ash pit, back of center. Slip the shaker grate into socket at back of the grate rest, thru the ashpit door, and lift the front end up into the U

shaped casting F 138 and hold in place with the long $\frac{3}{8}$ " round head pin slipped thru the holes in casting to hold in place and fasten with cotter pin.

6. Put the connecting bar in place on the lugs extending down from the grates, right or numbered side up, so it will not bind when the grates are shaken and hold in place with the three short round headed pins with heads to back side. Put the cotters in these pins to keep in place. Be sure to spread cotter pins. (Fig. 2) shows grate rest with grates installed.

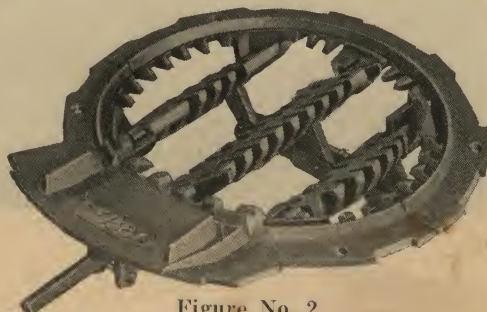
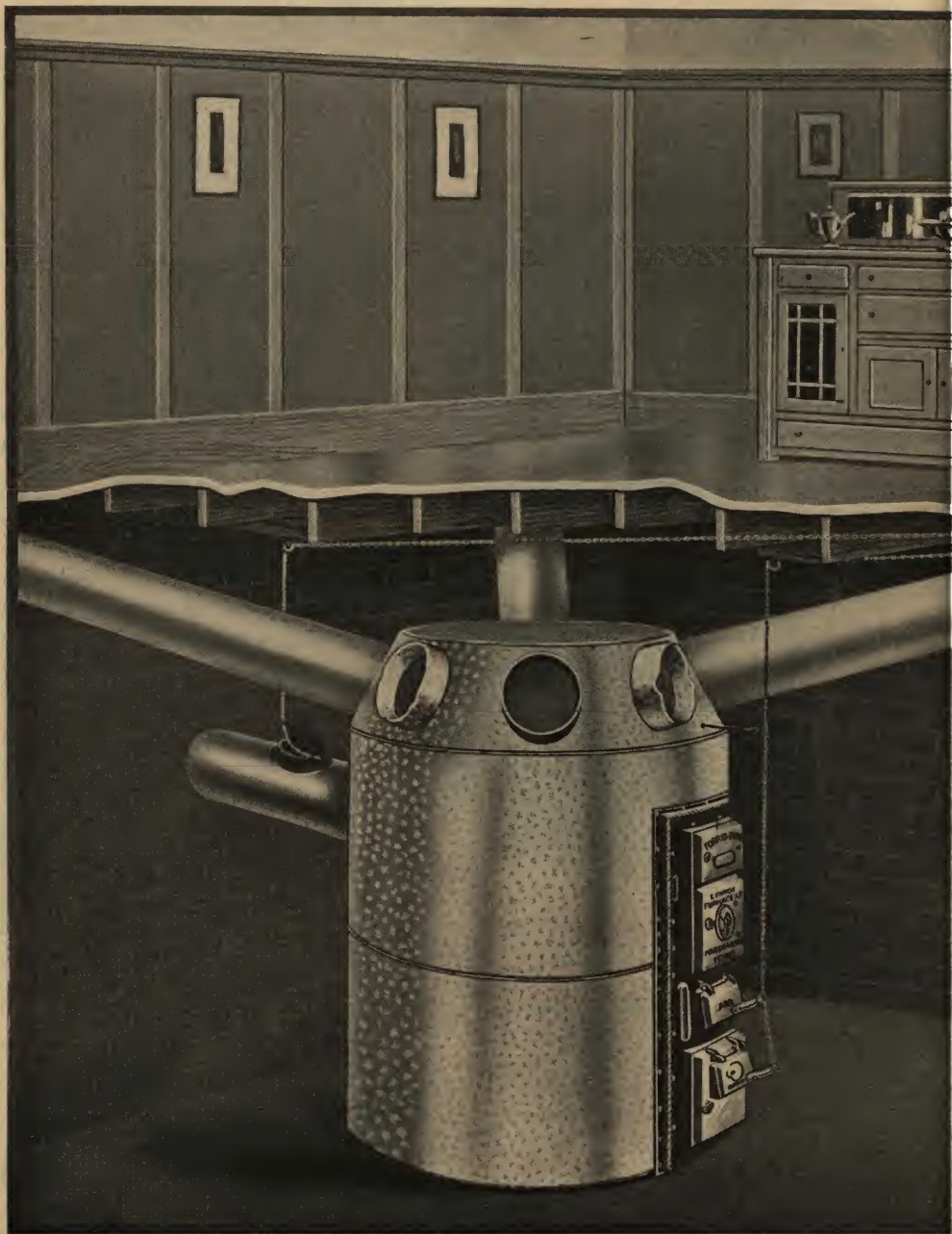


Figure No. 2



Figur



7. Remove the damper, damper post and cleanout cover wired inside the radiator. Put the damper in place in the partition of the radiator with the side marked (THIS SIDE TO THE FIRE) toward the square collar and put the damper post thru the top of the radiator and thru the square hole in the damper so that when the damper rod is pulled out the damper will be open.

8. Fill the collar on the radiator and cover collar on the furnace body with asbestos cement, then hang radiator in place. Use plenty of cement—a two pound can is packed in the bag of fittings.



Figure No. 3

9. Place the two brackets underneath the radiator and bolt to the castings on the furnace body using 2 $\frac{3}{8}$ x1 machine bolts for each bracket. Plumb radiator with side of body and hold brackets up against the bottom of the radiator and tighten bolts. Remove the surplus cement squeezed out of the joint and smooth the joint both inside and out. (Fig. 3) shows the radiator in place.

10. Remove wires from furnace front and put handles on feed doors and ash pit door just tight enough to work easily and draw doors tight when closed. Lean front against the furnace body, wall or on a box and cut asbestos paper found in the bag into strips about two inches wide and place four strips well soaked in water in the depression of the front corresponding to the flanges on the furnace body, both sides and top. The asbestos paper will stick to the casting if pressed firmly against the metal with the hand. Butt all joints—do not overlap.

11. Set the front in place at the bottom being careful not to disturb the paper and bolt in place to the door cap using two $\frac{3}{8}$ x1 $\frac{1}{4}$ " square head machine bolts, the nuts can be put on by opening the feed doors. Draw up as tight as you can by hand. It is important to put these top bolts in place first, then use $\frac{3}{8}$ x1" machine bolts for the two sides. Tighten the top bolts always in advance of tightening the side bolts using a wrench until every bolt is tight—go over these nuts two or three times.

12. Tear off surplus paper and use it to pack the space between the furnace bottom and the front pressing it in tight and smooth with a chisel or some other tool. Be sure the front is tight and no open places for air leakage between the front and the furnace body. This is important. Care in setting the front pays big dividends in satisfied customers.

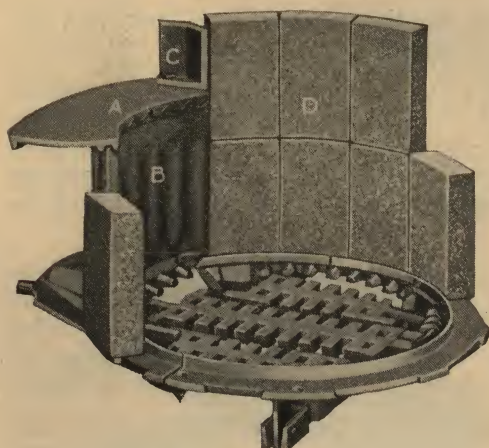


Figure No. 4

13. Fig. 4 shows the feed chute (a) front liner (b) one brick guard (c) and a part of the brick liners (d) in place on the grate rest. Place the front liner (b) in the groove of the grate rest at the center in front, then place the feed chute plate (a) on top of the front liner and bolt to the furnace front using 2 $\frac{3}{8} \times 1\frac{1}{2}$ " round head bolts. Reach thru the air blast door to put on the nuts.

14. Put the brick in place starting on either side and working around the fire pot. Keep the brick close together. If rivet heads interfere at front, chip off a little of the brick with a hammer so the brick will fit close. On some sizes of furnaces it will be necessary to split the last brick to fill out the row, an extra brick being allowed for this. To split a brick use a chisel and hammer and cut across the brick several times, using care so the brick will not break in the wrong place. Don't hit too hard. If half or part brick is used it is better to stagger joints in lining the furnace.

15. After the two rows of brick are in place, bolt the two brick guards (c) to the feed chute plate (right and left) with $\frac{3}{8} \times 1\frac{1}{4}$ " bolts, nuts on top side of the feed chute plate, and draw up tight. Tap the brick guards against the brick tight to hold them in place.

16. Fig. 5 shows the TORRID ZONE furnace ready to case. The TORRID ZONE casing bolts on the outside of the flange on the cast front and is shipped with holes cut for front and collars. You will find notches cut on the flanges of the cast front to show location of bolt holes to be used in casing the furnace. Use $\frac{1}{4} \times \frac{3}{4}$ " round head bolts for putting on the casing. Keep lugs on end of casing so they will bolt together on the outside. Hold casing in place and punch hole thru iron into hole on flange and while in place put in bolt and fasten.



Figure No. 5

17. The lower casing is made in two pieces and has lugs on the end to draw them together. Bolt to front with one bolt at top and

bottom of end and then slip joint together at back and bolt with the long $\frac{1}{4}$ " draw bolt. Do not draw up tight.

18. Bolt the split casing ring in place with lower edge behind casing and on outside of flange. Use $\frac{1}{4} \times 1\frac{1}{4}$ bolts. Slip ring inside of lower casing down to bead on ring and tighten up draw bolt enough to hold in place. Finish bolting casing to front and then draw up tight with draw bolt. Holes are punched in ring so casing may be bolted if desired.

19. The upper casing is in one piece. Place the casing around the furnace with the part cut out in front, put the end with smoke collar cut out over smoke collar and stick a punch in hole on top of collar to keep casing from coming off. Now put casing cut out in place on front and connect at back with draw bolt but do not draw up tight.

20. Bolt the two lower corners to the front to hold in place and take ring out of hood and put it in the casing at the top. Bolt casing to front and draw up with draw bolts at back.

21. Bolt the corrugated lining inside the upper casing by punching holes thru the casing and lining about $1\frac{1}{2}$ " from top. Keep lining below solid ring.

22. Place water pan frame in upper casing on either side about 18" from the front. The higher up it is placed the more rapid will be the evaporation. Cut out casing and inner lining so water pan can be put in and taken out freely.

23. Put on the hood and after holes have been cut for warm air runs punch a hole for damper rod about 2" up on the hood and to the right side of furnace front. Slip the cast washer on the damper rod and insert thru hole in hood and connect to lever arm on damper post. Fasten with cotter pin. Be sure the damper opens when the rod is pulled out. Bolt the washer to the casing.

24. In piping warm air runs see that they start at an even height and as close to top of hood as possible. For long runs use a size larger pipe than required for short runs. Provide returns 10% larger than total area of warm air pipes. It is better to have too much than too little. Never put cold air shoes more than 14" up on casing.

25. Connect furnace to good flue, put check draft on smoke pipe and collars around smoke pipe and cleanout and draw up tight.

26. Flush around base ring with cement so dust and dirt from basement cannot get into the air chamber. See that all connections on furnace and pipes are made tight to insure a circulation of clean air.

27. Put draft lifts on draft door and air blast door. See Fig. 6 for proper connection of regulator to draft and check. Fasten regulator plate at some convenient place on the first floor and connect chains to basement chains. If a long chain is required use a piece of wire between pulleys, always allowing enough chain to run over pulleys. The counter weights (found in fitting box) are made with corrugated

appearance so that any excess weight may be broken off by a sharp blow. The part broken off may be wired to other weights if needed.

28. The furnace is now ready to fire.

29. DIRECTIONS FOR INSTALLING F 22 AND NO. 44 WATER FRONTS: Remove the front liner and feed chute plate and place water front with lugs in the inside groove on grate rest ring, when



Figure No. 7

slots are provided for same, letting the front extend into firepot. Run 8" nipples thru openings in furnace front keeping them level. Replace feed chute plate on top of water front and bolt in place. Place the cast washers tight up against furnace front to close opening around pipe. It is a good plan to use some wet asbestos back of collars. You are ready for the plumber to connect to range boiler. Do not pull

the water front out of the groove on the grate rest but let it extend into the firepot. The front liner is not used when the water front is installed. Do not fire the furnace until water is turned on, it is likely to crack the water front. Fig. 7 shows the F 22 water front in place on the grate rest.

30. It pays to listen and learn. These instructions represent the composite wisdom of thirty-one of our most experienced heating engineers and installers whose speed at installation and correct methods are derived from more than twenty years of experience with TORRID ZONE furnaces. It will pay every installer to follow these directions to the letter.

31. Every Torrid Zone furnace is set up complete by our shipping department before it leaves the shipping floor.

